

X-13-SAM (Spec-file Automated Modifications) Version 1.1

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1. Introduction

X-13ARIMA-SEATS input specification files (spec files) are text files; editing them one at a time is simple and can be done with any text editor. However, making changes to multiple spec files can be time-consuming. X-13-SAM lets you quickly make changes to many spec files at one time.

With X-13-SAM you can remove specs (named functional units within a spec file), add specs, and add or change arguments (named values that control program settings). It also includes commenting and reformatting options. All the changes that can be made with X-13-SAM are detailed in [Section 4](#).

Changes to Version 1.1 include:

- the ability to delete all outliers before or after a specified date;
- the ability to change only the start or end date of a span argument;
- the ability to edit arguments not included in the argument list drop-down box;

- a fix to how output options (directories/suffixes) work when reading the spec files from a metafile;
- and various bug fixes.

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<https://www.census.gov/data/software/x13as/disclaimer.html>.

2. Requirements and Installation

X-13-SAM has been tested on Windows 8 and 10; it may be compatible with previous versions of Windows. To run X-13-SAM, you must have .NET Framework Version 3.5 on your computer. This is available at <https://www.microsoft.com/en-us/download/details.aspx?id=21>.

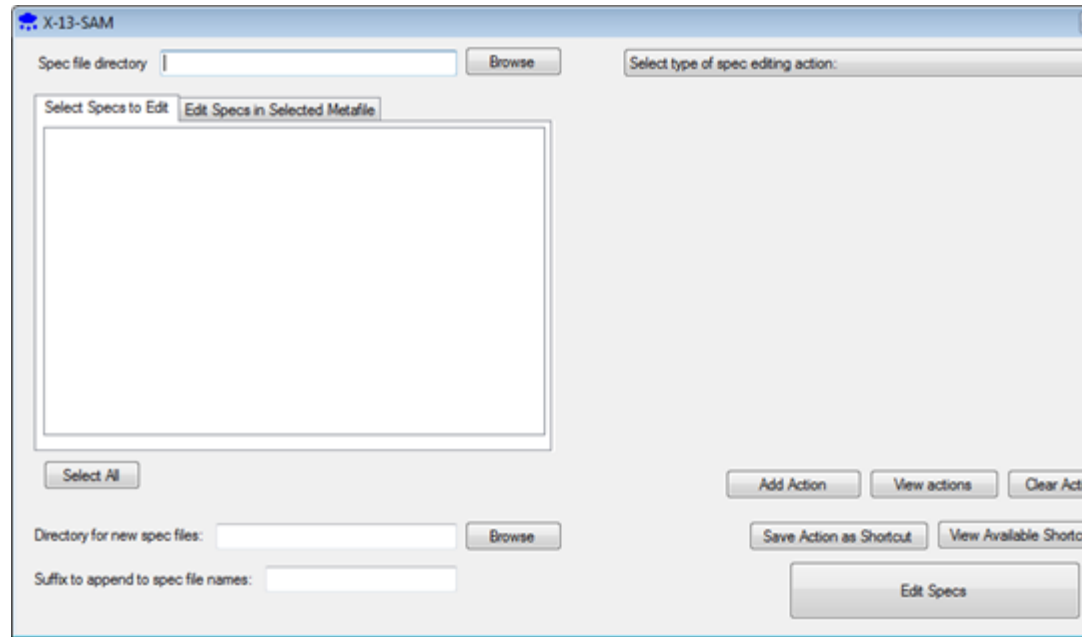
To install the X-13-SAM program, follow the instructions below:

1. Copy the X-13-SAM zip file (**x13sam_V1.1.zip**) to your computer.
2. Uncompress the file. X-13-SAM will be stored in a **x13sam** subdirectory.

To start the program, open (double click on) the file **X13SAM.exe**.

3. Instructions

To edit spec files with X-13-SAM, first select the spec files to edit. Then add the *edit actions*, which tell X-13-SAM exactly how to edit the spec files. Next select the output options for saving the new spec files, and finally run the program.



Select the spec files to edit

In the *Spec file directory* text box, type in the directory containing the spec files to edit, or use the *Browse* button to find it. The spec files will be listed in the list box. Select the spec files to edit.

If the spec files to edit are listed in a metafile (a file with extension .mta listing spec files), choose the *Edit Specs in Selected Metafile* tab and select the metafile. All the listed spec files will be edited. Metafiles used in X-13ARIMA-SEATS can provide alternate output destinations and names, but X-13-SAM will ignore this output information. Only the output options discussed below can direct the file names and directory for the edited specs.

Select the edit actions

The drop-down box *Select type of spec editing action* contains the edit action categories described in Section 4. These are the instructions on exactly how to edit the spec files. Once you have selected the action according to the instructions below, press *Add action* to add it to the list of actions to be performed.

View this list by pressing *View actions*. In the window that appears, actions can be removed or reordered. Actions are

listed in the order they will be implemented in editing the spec file.

Edit actions can also be added to a shortcut list. This list is saved when the program is exited and automatically loads when the program is restarted. If there are actions you anticipate using often, it can be convenient to add them to your shortcut list so you can quickly add the action to your edit action list. [Section 5](#) discusses shortcuts in more detail.

Select the output options

It's best not to overwrite your current spec files in case the program does not perform as anticipated or if you need the original spec files for other purposes. X-13-SAM provides two options for saving the edited spec files. You can provide a *Directory for new spec files* and a *Suffix to append to spec file names*.

The edits to the spec file "Shoe Stores.spc", found in C:\data\retail\, will be saved as

- C:\data\retail\shoe stores.spc by default (if no alternate output information is given).
- C:\data\retail\newspecs\shoe stores.spc if the output directory is C:\data\retail\newspecs.
- C:\data\retail\shoe stores_edit.spc if _edit is given as the suffix.
- C:\data\retail\newspecs\shoe stores_edit.spc if both the output directory and the suffix _edit are given.

Run the program

Press *Edit specs* to start the editing. Once the program has edited all the spec files, a log of the changes will appear. (This log can be saved as a text file by pressing *Save log*.) To return to the main X-13-SAM screen from the log, choose either *Close: Retain Action List* or *Close: Clear Action List*.

The following sections describe each of the edit actions available in the drop-down box.

4. Edit Action Details

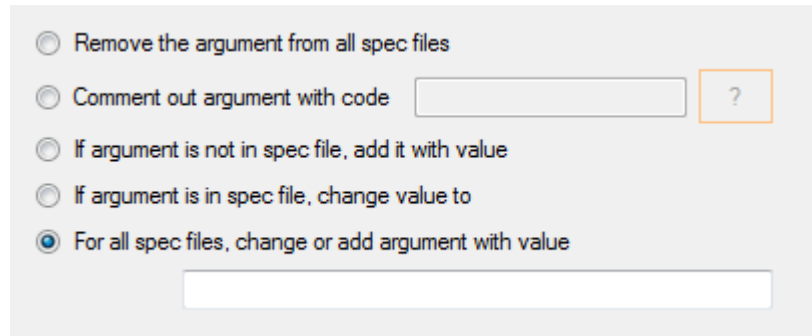
The following sections describe each of the edit actions available in the drop-down box.

4.1 *Edit arguments in a spec*

When *Edit arguments in a spec* is selected, two additional drop-down boxes will appear. Select the spec name from the first box and the argument to edit from the second. If you don't see the argument you want to edit, select 'New Argument' and provide the argument name in the box that pops up.

All arguments can be removed, commented out, added, or changed. Some arguments have additional edit actions available, which will be described later in this section.

For all arguments, you'll see these options appear:



The screenshot shows a light gray panel with five radio button options. The first option is 'Remove the argument from all spec files'. The second is 'Comment out argument with code' followed by a text input box and a small orange box containing a question mark. The third is 'If argument is not in spec file, add it with value'. The fourth is 'If argument is in spec file, change value to'. The fifth and selected option is 'For all spec files, change or add argument with value', followed by a text input box.

Remove the argument from all spec files will remove the argument and its value.

Comment out argument with code ____ will add a "#" before the argument. (X-13ARIMA-SEATS ignores all text following a "#" when it runs.) If you would later like to uncomment the argument with X-13-SAM, you'll need to enter a comment code in the text box. X-13-SAM will add this code immediately after the "#" when it comments out the argument. For example, if you comment out the span argument in the `outlier{ }` spec using the code `~ospan~`, the spec

```
outlier{ span = (2015.1, )
types = all }
```

will become

```
outlier{ #~ospan~span =  
(2015.1, )  
types = all }
```

Later, you can uncomment the argument by providing the code. (See [Section 4.6.](#))

The final three arguments allow you to add an argument or change its value. *If argument is not in spec file, add it with value ____* will add an argument to a spec if the spec itself is in the spec file but the argument is not. ***This action is ignored if the spec is not in the spec file.*** If you want to make sure your argument is added but you are not sure the spec is in every spec file being edited, include an [Add a spec](#) action in your action list.

If argument is in spec file, change value to ____ will replace the entire current value of the argument to the value provided.

For all spec files, change or add argument with value ____ will change the arguments value to the new value if it exists, and will add the argument with the given value if it does not exist AND if the argument's spec is in the spec file.

Some arguments have specialized edit actions available.

arima{} model argument

While for most arguments the entire value is changed when *If argument is in spec file, change value to ____* is selected, for the ARIMA model argument you can change only one of the components of the model. An ARIMA model is often given in the form (p d q)(P D Q), where the first component is the nonseasonal and the second the seasonal component. (If only one component is given, say (0 1 1), this is taken to be nonseasonal unless followed by a 4 (for quarterly) or 12 (for monthly).) To change only one of the components, enter the new ARIMA model with (p d q) -- not

case sensitive -- as the component to keep the same.
For examples, see the table below. This feature
works only for models up to two components.

ARIMA Model Argument Examples

Value in edit box	Current ARIMA Model	New ARIMA Model
(p d q)(0 1 1)	(1 1 0)(0 0 1)	(1 1 0)(0 1 1)
(P D Q)(0 1 1)	(1 1 0)	(1 1 0)(0 1 1)
(p d q)(0 1 1)	(1 1 0)12	(0 1 1)12
(0 1 2)(p d q)	(0 1 1)(0 1 1)	(0 1 2)(0 1 1)
(0 1 2)(P D Q)	(0 1 1)	(0 1 2)
(0 1 2)(p d q)	(0 1 1)12	(0 1 2)(0 1 1)
(p d q)	(0 1 2)(0 1 1)	(0 1 2)
(p d q)12	(0 1 2)(0 1 1)	(0 1 1)12

Span arguments

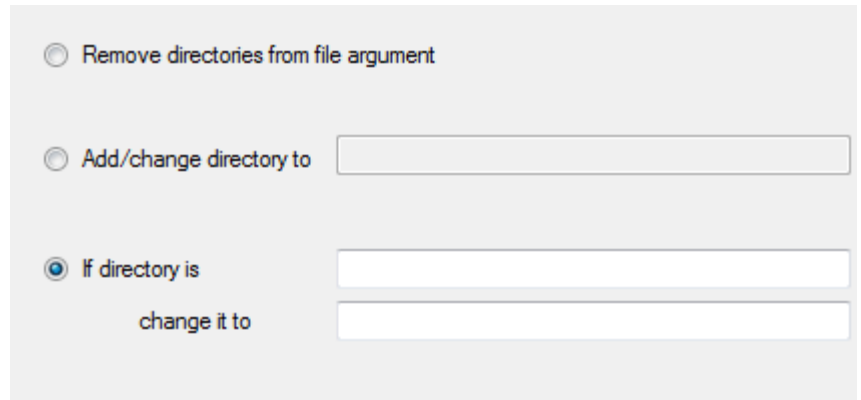
All span and modelspan arguments in X-13ARIMA-SEATS have the form ([start date] , [end date]), with the dates given in yyyy.mm format. For example, 2019.1 represents the first month or quarter of 2019. Both the [start date] and the [end date] are optional; the program uses the data from the beginning or until the end, respectively, if one is missing. With X-13-SAM, you can change only the start or only the end date of a span or modelspan argument by entering yyyy.mm in the place of the date to leave unchanged. See the table for examples.

Span Argument Examples

Value in edit box	Current Span	New Span
(yyyy.mm, 2018.12)	(2008.1, 2017.12)	(2008.1, 2018.12)
(yyyy.mm, 2018.12)	(, 2017.12)	(, 2018.12)
(yyyy.mm, 2018.12)	(2008.1,)	(2008.1, 2018.12)
(2005.1, yyyy.mm)	(2000.1, 2017.12)	(2005.1, 2017.12)
(2005.1, yyyy.mm)	(2000.1,)	(2005.1,)
(,yyyy.mm)	(2008.1, 2017.12)	(, 2017.12)
(2005.1, 2018.12)	(2000.1, 2017.12)	(2005.1, 2018.12)

File arguments

When a `file` argument is selected, a checkbox *Edit directory info* appears next to the argument drop down box. Check this box to see the following options appear:



The screenshot shows a light gray panel with three radio button options. The first option is 'Remove directories from file argument' with an unselected radio button. The second option is 'Add/change directory to' with an unselected radio button and a text input field to its right. The third option is 'If directory is' with a selected radio button, followed by a text input field. Below this, the text 'change it to' is centered, with another text input field to its right.

Remove directories from file argument will remove any directory information but retain the file name and extension. *Add/change directory to* ____ will look for the `file` argument; if it is in the spec file, it will add the provided directory to the argument's value or change the current directory to the new one. If you want the directory changed only if it is some specific directory, use the *If directory is* ____ *change it to* ____ option. Leave the first box blank to insert the provided directory into the `file` argument only if there is no directory currently in the argument, and leave the second box blank to remove a directory only if it is the one provided in the first box.

In all three cases, the file name and extension will remain unchanged. To change the file name, uncheck the *Edit directory info* box and use the edit argument options as usual.

series{} title argument

You can customize title edits to your series using the keywords `[specname]`, `[outputname]`, and `[title]`.

When writing your new title, X-13-SAM will replace `[specname]` with the name of the spec file

and [outputname] with the name of the new spec file being written. If you are editing the spec file "Shoe Stores.spc", then adding the title "[specname]: Automatic Options" will result in the title "Shoe Stores: Automatic Models". If you are saving your new spec files with the suffix "_amd", then the title "All Auto Options - [outputname]" will result in the title "All Auto Options - Shoe Stores_amd".

Use [title] to insert the current title into the new title. If "Shoe Stores.spc" has the title "Retail Sales at Shoe Stores", then editing the title to "[title]: Shortened Model Span" would result in "Retail Sales at Shoe Stores: Shortened Model Span".

Use [title:] to retain the title up to and including the first colon. If the current title is "Shoe Stores: Automatic Options", then "[title:] Airline Model" would result in "Shoe Stores: Airline Model". If there is no colon, the entire title will be used and a colon inserted after the original title. If the [title:] is at the end of the new title, the colon will be removed.

If you use [title] or [title:] and there is no `title` argument in the `series{}` spec, the spec file's name will be used instead.

regression{} variables argument

When you select the `variables` argument in the `regression{}` spec, check the box *Edit list values* to edit individual items in the list of regression variables. You can either add items to the list or remove specific items from the list.

? ☒ Add a variable to the list
☐ Remove a variable from the list

Variable

*An item will be added to the list only if the **variables** argument exists in the spec file.* If you're not sure that it exists in all the spec files being edited, first include an action to add the `variables` statement to the `regression{ }` spec.

X-13-SAM will check whether the exact item you're adding is in the `variables` list before it adds it; however, it will not check for variations of items. For example, if your `variables` statement includes `easter[8]` and you add an action to insert `easter[8]` into the spec files, it will not add a second `easter[8]` regressor. However, if you ask X-13-SAM to add `easter[1]`, it will add this even though `easter[8]` is already there. If you want only `easter[1]` in your spec files, first add an action to remove `easter[w]` regressors from the list, and then add the action to insert `easter[1]`.

To add a regressor to the list, first select the regressor from the drop down box. If the regressor needs a window length for a holiday effect of an inventory day for stock trading day, a second drop down box will appear with the possible options. If the regressor needs a date, a text box will appear for you to type the date in. If the regressor includes a change of regime, X-13-SAM assumes you want a full-change regressor (`td/yyyy.mm/`, for example). If instead you want a partial change (`td//yyyy.mm/` or `td/yyyy.mm//`), you must type the appropriate slashes into the box along with

the date. *No checking is done to see if the date supplied is valid.*

To remove items from the variables list, select the regressor from the drop down box.

For regressors that need a window length or day of inventory, a drop down box will appear with possible options. If you select a number from the list, only that particular regressor will be searched for and removed. If you select [any], all regressors of that type will be removed.

For regressors that need a date, a box will appear to type in the date. Leave this box blank to remove arguments regardless of date. For example, selecting AOyyyy.mm and leaving the *Date* box blank will remove all additive outliers. If you enter a date, only that specific outlier will be removed. Selecting AOyyyy.mm and entering 2008.Apr will remove AO2008.Apr, ao2008.04, Ao2008.4, ao2008.apr, etc. It will not remove AO2008.May. You can remove all outliers of a selected type (AO, LS, TC, and SO only) before or after a specified date by including <=, >=, or > with the date. For example, if you select LSyyyy.mm and enter the date

- <2007.12, all LS outliers before December 2007 will be removed; LS2007.12 would remain.
- >=2015.1, all LS outliers on or after January 2015 will be removed.

X-13-SAM can only remove all arguments that cover a date range -- ramps and AO or LS sequences. It cannot remove the outliers covering a specific range. So you can remove all ramps RPyyyy.mm-yyyy.mm, but you cannot remove only RP2008.1-2008.10.

If you select a change-of-regime regressor, a box for the change date appears. Leave this box blank to remove all change-of-regime

regressors of the selected type. If you enter only a date, all change-of-regime regressors of that type at that date will be removed (regardless of whether they are full- or partial-change regressors). If you enter yyyy.mm surrounded by start and end slashes, all change-of-regime regressors with that regime pattern will be removed. For example, select td/yyyy.mm/ and type in //yyyy.mm/ to remove td//2009.1/ or td//2002.Jan/, but not td/2009.1/ or td/2002.Jan//. If you enter a date and start and end slashes, only that exact regressor will be removed.

4.2 Add a spec

Select *Add a spec* from the drop down box to add a spec and any arguments you request to the spec file. When you select this argument, you'll see a drop down box appear from which you can select the spec name. Then type the arguments for the spec into the text box.

Formatting: If nothing is in the argument box, X-13-SAM will include the spec with open and close braces on the same line. If arguments are included, X-13-SAM will include the spec name with the open brace on one line, followed by the arguments exactly as typed but indented four spaces on the next lines, and the closing brace on the next line.

Use the options below the argument box to select when the spec will be added to the spec file. The options are

- *If spec exists, overwrite it with these arguments; add spec if it does not exist.*

- *If spec exists, do nothing; add spec only if it does not exist.*
- *If spec exists, overwrite it; if it does not exist, do not add it.*

For example, in the following image we request an `automdl{}` spec with three arguments be added:

Select spec to add: automdl ▼

Enter the arguments and values to add to the spec

```
mixed = no
maxorder = (3 1)
print = all
```

☐ If spec exists, overwrite it with these arguments; add spec if it does not exist.
☐ If spec exists, do nothing; add spec only if it does not exist.
☒ If spec exists, overwrite it; if it does not exist, do not add it.

Since *If spec exists, overwrite it; if it does not exist, do not add it* is selected, the spec

```
automdl{
  mixed = no
  maxorder = (3
1)
  print = all
}
```

will replace all current `automdl{}` specs. However, if the spec file instead has an `arima{}` spec, this new `automdl{}` spec will not be added.

4.3 Remove a spec

After choosing *Remove a spec* from the edit action drop down box, select the spec to remove from the drop down box which appears. This will remove the spec and all its arguments.



Select spec to remove: check ▼

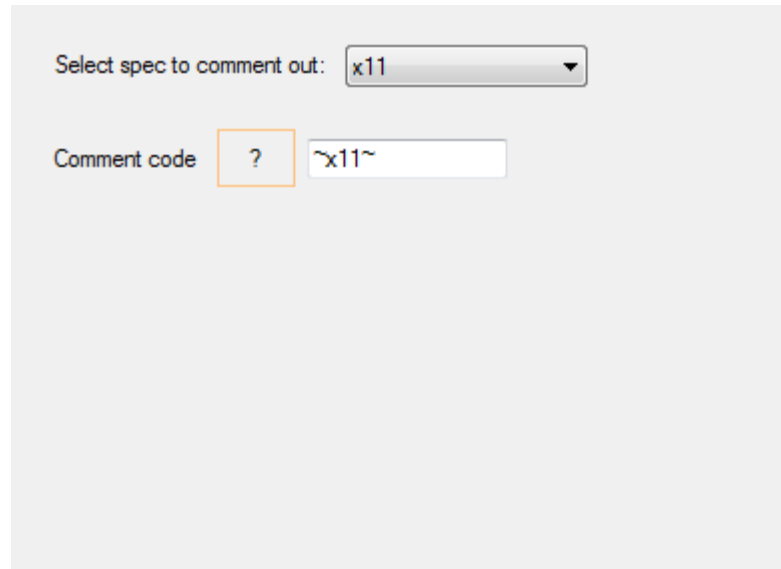
☐ Remove all comments within the spec

If you check the box for *Remove all comments within the spec* everything between the start and end braces for that spec will be removed. If you leave it unchecked, all uncommented text will be removed but any comments between the braces will remain in the spec file.

4.4 Comment out a spec

To comment out an entire spec, select *Comment out a spec* and select the spec name from the drop down box. You have the option to supply a *comment code*, which will include this text after the “#” sign when the spec is commented out. By supplying this code, you can later return commented text to the spec file using X-13-SAM. (X-13-SAM does not have an option to read through comments to find particular

specs or arguments and uncomment them; it is only able to uncomment specs and arguments by searching for particular text strings of “#” followed by a supplied comment code.)



The screenshot shows a software interface with two main input fields. The first field is a dropdown menu labeled "Select spec to comment out:" with "x11" selected. The second field is a text input labeled "Comment code" with a question mark icon and the text "~x11~" entered.

For example, say you want to to run the series with `seats{ }` but your spec files have `x11{ }` specs. If you know you'll want to change back to the current `x11{ }` specs later, you can comment out the `x11{ }` spec with the comment code `~x11~`. After running X-13-SAM, your `x11{ }` spec may look like:

```
#~x11~x11{
#~x11~      seasona
lma = s3x3
#~x11~      sigmali
m = (1.8 2.8)
#~x11~}
```

4.5 Remove all comments from spec file

Select *Remove all comments from a spec file* to locate all “#” signs in the spec files and remove them along

with all text following it on the same line.

Important: X-13-SAM does not differentiate between “#” signs intended as comments and “#” within quotes, as a title. For example, if your spec file has the argument

```
title = "Run #1:  
All Automated"
```

this option will change this to

```
title = "Run
```

which will cause a problem when X-13A-S runs the spec file, as there are unclosed quotation marks.

4.6 Comment in coded comments

Enter the comment code to identify comments to return to the spec file:

?

Select *Comment in coded comments* and enter a comment code in the text box to locate all comments followed by the user-designated text string (the comment code) and convert them from comments to executable lines of the spec file. See [Section 4.4](#)

for more details about comment codes.

4.7 Trim white space at end of lines

Select *Trim white space at end of lines* to remove all spaces and tabs at the end of lines in the spec files.

4.8 Remove all extraneous white space

Select *Remove all extraneous white space* to remove:

- All double spaces and tabs, except at the beginning of a line
- The spaces around the equals sign
- The spaces before and after curly brackets
- The spaces immediately following the start of parentheses and immediately preceding their end.

4.9 Compress lines

Select *Compress lines* to create a new spec file with fewer lines. Instead of the current line spacing, this option will put as much as possible on each line, with each line ending when:

- There is a comment on the line
- There is an end curly bracket on the line
- Adding the next line will result in more than 80 characters on the line.

4.10 Reformat specs in Win X-13 style

Select *Reformat specs in Win X-13 style* to change the format of the spec files to something closer to those created by Win X-13. This option will change the order of specs; indent argument and comment lines four spaces; change spec names, argument names, and all values not in quotation marks to lower case; and ensure there is one space before and one space after equal signs.

5. Shortcuts

If there are actions you repeat frequently with X-13-SAM, consider adding a shortcut to the action. To do this, select the action as you do when adding new actions, and press the *Add Shortcut* button. The action will be added to your list of shortcuts, and the list will be retained from session to session.

To use a shortcut, press the *View Shortcuts* button. In the window that appears, select the action(s) you'd like to use, press *Add Action*, and close the window. If you press *View Actions*, you'll see your shortcut action has been added to the list of actions to perform when editing your spec files.

This can save time with the more complex edit actions you use frequently, like adding a spec with multiple arguments or adding/removing seasonal regressors.

6. Support

Contact Demetra Lytras at demetra.p.lytras@census.gov or 301-763-7426 with any questions.